~~TITLE OF THE INVENTION~~

~~MAGNETOMECHANICAL SYSTEM FOR REDUCTION OF THE RECOIL OF A GUN.~~

~~CROSS-REFERENCE TO RELATED APPLICATIONS~~

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~~MAGNETOMECHANICAL SYSTEM FOR REDUCTION OF THE~~ RECOIL MECHANISM WITH MAGNET FOR [[OF]] A GUN [[.]]

BACKGROUND OF THE INVENTION

A invention concerns a recoil mechanism for reducing the recoil of a gun ~~A magnetic-mechanical system for the recoil's reduction , which is developed in a gun upon firing.~~ When a gun, as a mechanical system, is fired, the bullet travels along the gun's barrel and exits its muzzle. The resulting reactive force is imparted to the gun in the form of recoil. ~~The gun, whereas it is a mechanical system and while a fired bullet runs the distance from the gun-barrel's chamber to the gun-barrel's muzzle, it acts as a reactive system like an internal combustion engine.~~ Apart from the gun's recoil phenomenon which is caused ~~of the instantaneous~~ upon firing in the chamber because of the bullet's charge, the produced explosion gives to the gun's frame an instantaneous kinetic energy, annihilating any inertia phenomenon, which was prevailing in the reference system between the gun and the user before the explosion.

BACKGROUND ART

For the avoidance of the recoil phenomenon the current technology of portable guns like [[the]] semi-automatic pistols, automatic pistols, submachine-guns and/or other heavy weaponry, the recoil systems [[bring]] use in most cases a recoil spring. Different technical solutions are used for the increase of the inertia of the reference system between the gun and the user, which nevertheless are restricted to small improvements in the present case,

like:

1. By the addition of a mercury pouch on the gun's front end, so as to cause vertical resultant force, in order to increase the gun's inertia over the gun-barrel's recoil.

2. By [[the]] gas escape from blow holes of the gun-barrel's top with a direction opposite of the gun's recoil direction upon shooting.

BRIEF SUMMARY OF THE INVENTION

The invention is a recoil mechanism for a gun that reduces the adverse effect of recoil. ~~, which will be described, is referred to the creation of an absorption– reduction magnetomechanical system of this axial force, which causes the recoil.~~ The invention is based[[,]] on a magnet's [[(M)]] presence, which in cooperation with successive springs, of the same or different diameter, of coil or wire type ~~spring's coils or wire's of springs diameter's~~, controls the acceleration and the deceleration of the slide's reciprocating motion in a gun. Also by the mechanical only method, wherein one of the successive springs, having the same axial or another axial arrangement level and in succession with the [[pre-]]mentioned successive springs, takes part [[to]] in the motion[[s' process]], with a time lag. This happens because ~~its edges~~ the ends of one of the springs do not abut from the beginning [[to]] reference points [[upon]] in the gun, but only after the firing of each bullet [[in it]]. The result of all this function is the ~~biggest~~ greatest possible control of the gun's recoil.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Fig. 1 is a longitudinal sectional view of a first embodiment of a recoil mechanism for a gun according to the invention; and

Fig. 2 is a longitudinal sectional view of a second embodiment of the recoil mechanism according to the invention.

~~List of parts~~:

~~(1) cylinder,~~

~~(2) spring,~~

~~(3) spring,~~

~~(4) axle,~~

~~(5) spring,~~

~~(6) set screw,~~

~~(7) round nut,~~

~~(8) collar,~~

~~(9) base,~~

~~(A) chamber,~~

~~(B) chamber,~~

~~(E) nut,~~

~~(K) slide,~~

~~(M) magnet,~~

~~(P) extension of the axle,~~

~~(R) gun-barrel,~~

~~(S) point on the cylinder,~~

~~(T) flange,~~

~~(Y) diaphragm.~~

~~Brief presentation of figures -1- and -2- of the suggestive solution.~~

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, Figs. 1 and 2 illustrate two embodiments of a recoil reduction mechanism for a gun, which both include a cylinder 1 having a large diameter portion that extends into a first spring 5. ~~In figure -1- is presented the arrangement of the absorption – reduction mechanism which is consisted of the cylinder (1), exteriorly of which, the spring (5) is positioned.~~ The cylinder [[(1)]] 1 is divided, by [[one]] a diaphragm ~~(Y), in~~ Y into two chambers namely, [[the]] a first or rear chamber [[(A)]] A in the large diameter portion and [[the]] a second or front chamber [[(B)]] B in a small diameter portion of the cylinder 1. ~~and in which chambers, the axle (4) is inserted.~~ In the embodiment of Fig. 1, an axle 4 extends in both chambers A and B, and in the embodiment of Fig. 2 the axle 4 extends only in the first chamber A. ~~In chamber (A) is inserted the spring (2) and in chamber (B) is inserted the spring (3).~~ A second, small diameter spring 2 is inserted in the first chamber A and a third, small diameter spring 3 is inserted in the second chamber B. ~~The transversal set screw (6) locks the chamber (B) and the round nut (7), locks the axle (4).~~ A set screw 6 closes one end of chamber B and a rear end of axle 4 that is opposite from chamber B is threaded into a round nut 7 to fix the axle to the frame to which the nut 7 is fixed. ~~The round nut (7) is screwed on the right edge of the axle (4). The right edge~~ This rear end of the axle [[(4)]] 4 abuts ~~on the still~~ the frame of the gun and by extension it abuts on the gun's handgrip. In the embodiment of Fig. 1, an extension P ~~The extension~~

~~(P)~~ of the axle [[(4)]] 4 penetrates the ~~transversal~~ set screw [[(6)]] 6 and forms part or all of the base for the support of [[the]] a magnet [[(M)]] M, which magnet [[(M)]] is locked by [[the]] a locking nut [[(E)]] E threaded to the front end of the axle extension P. ~~and of which magnet (M) the magnetic lines attract the slide (K) and the cylinder (1).~~ Lines of magnetic force of magnet M, attract the front end of the slide K of the gun. ~~In figure -2- the Magnet (M) is supported on the base (9), while the extension (P) of the axle (4) is subtracted.~~ In the embodiment of Fig. 2, there is no axle extension but the magnet M is supported on a base 9 of the gun.

~~DETAILED DESCRIPTION OF THE INVENTION~~

~~Figure -1- arrangement analysis.~~

~~The big exterior~~ In Fig. 1 the recoil mechanism for the gun having a gun-barrel R and the slide K, comprises the large diameter ~~of the~~ portion of the cylinder 1 extending into the first spring 5 which has a rear end that ~~(1) is coming through the spring (5) of which the right edge~~ abuts ~~on the~~ a flange [[(T)]] T of the cylinder 1. Spring 5 has a large ~~(1) which is configured in a bigger~~ diameter, and ~~the left edge of which spring (5)~~ its opposite front end abuts [[on]] the gun's slide K. ~~(K). The axle (4) bears the round nut (7) and is formed to the collar (8), which round nut (7) and collar (8), immobilize the axle (4) and meanwhile they function as the points of reference of the springs.~~ The axle 4 is immobilized by its rear end being fixed in the nut 7 and by including a collar 8 in the chamber B, forward of the diaphragm Y.

~~The spring (2), entering chamber (A), by the left edge abuts on the diaphragm (Y) and by the right edge abuts on the round nut (7) which is screwed on the axle (4).~~ The second spring 2 in chamber A has a front end that abuts diaphragm Y and a rear end that

abuts nut 7.

When the springs [[(5)]] 5 and [[(2)]] 2 are installed in the slide [[(K)]] K they ~~have the~~ are under a minimum compression. The third spring [[(3)]] 3 is positioned in chamber [[(B)]] B and is ~~locked~~ trapper by the set screw [[(6)]] 6, but since the length of the spring [[(3)]] is shorter than chamber's [[(B)]] length, the two ends [[edges]] of the spring [[(3)]] 3 are [[in]] at a distance, on the one hand, from the set screw's [[(6)]] surface, and on the other hand, from the collar's [[(8)]] surface.

The system's function upon firing is as follows.

~~A flash~~ An instant before the firing of the gun, the spring [[(2)]] 2 and the spring [[(5)]] 5 are under ~~have the~~ minimum compression while the spring [[(3)]] 3, which is positioned in the chamber [[(B)]] B, is under zero compression. The front surface of the slide [[(K)]] K under the gun-barrel muzzle and the front surface of the cylinder [[(1)]] 1, adjoin the magnet [[(M)]] M.

Upon firing the force of the gases generated in the gun-barrel and on the slide, reach a point that overcomes the attraction between the magnet M and the slide K. The slide is then violently set into rearward motion, cutting the lines of force between it and the magnet. This start of the recoil action compresses the spring 5 which pushes the cylinder 1 to the rear. ~~gases' pressure touches the point, which is critical for the magnet's attraction on the slide (K). The slide (K) is violently set in motion, cuts the magnetic lines and starts to recoil and to compress the spring (5), which spring (5) presses the cylinder (1).~~ The spring [[(2)]] 2, and the magnet's [[(M)]] attraction, does not permit the cylinder [[(1)]] 1 to [[drift]] move immediately to recoil. ~~Thereby the slide (K)~~ The K continues its recoil until it hits a step S between the large and small diameter portions of the cylinder 1 ~~the cylinder's~~

~~point (S), which is shaped in a bigger diameter~~.

At step or point S of the cylinder 1, the slide K hits the cylinder 1, and further compression of spring 5 is interrupted ~~On point (S) of the cylinder (1), where the slide (K) hits the cylinder (1), any further spring's (5) compression is interrupted~~. As the gases continue to increase their pressure [[into]] in the gun-barrel, they get to the point which is critical for the magnet's [[(M)]] attraction on the cylinder [[(1)]]. Here, [[at]] the continuous recoil of the slide [[(K)]] sets also the cylinder [[(1)]] 1 to recoil, and [[keeps]] pulls it away from the magnet M [[(M)]].

Upon this phase, the slide [[(K)]] K, the spring [[(5)]] 5, the cylinder [[(1)]] 1 and the set screw 6 [[(6)]], recoil as an assembly which compresses the spring 2 [[(2)]]. Since the axle [[(4)]] 4 is not moving towards any direction and since the cylinder [[(1)]] 1 recoils, compressing meanwhile the spring [[(2)]] 2, the set screw [[(6)]] 6, because of the fact that it is screwed in the cylinder ~~(1), minimizes~~ 1, reduces the space that [[has]] contains the spring [[(3)]] 3 in the chamber [[(B)]] B between the set screw [[(6)]] 6 and the collar [[(8)]] 8. Up to this moment, wherein the expansion takes place from the bullet's firing, and which expansion acts over the slide [[(K)]] K, only two springs function as a retroaction system, since they are positioned successively, to wit the first spring [[(5)]] 5 and the second spring [[(2)]] 2 function as one. Since the slide's [[(K)]] recoil is continued with [[the]] decelerated movement, ~~therefore~~ and with the movement of the cylinder [[(1)]] also, and while the spring [[(2)]] 2 approaches [[the]] 3/5 [[of the]] completion ~~of its compressing~~, then the third spring 3 [[(3)]] abuts on the set screw [[(6),]] 6 and the collar [[(8)]] 8. The decelerated movement of the slide [[(K)]] K and of the cylinder [[(1)]] 1 meets the third spring [[(3)]] 3 in total inertia, hence the spring [[(3)]] 3 absorbs the most of the rest of the slide's [[(K)]]

recoil energy, before the spring 3 compresses to its maximum extent. ~~(3) enter to the absolute procedure of compressing.~~

The result is ~~to be interrupted~~ that any further recoil of the slide [[(K)]] before it [[hit]] hits the frame and since the gases' expansion is completed, the cylinder [[(1)]] 1 and the slide [[(K)]] K begin to move in opposite ~~direction~~ directions, with [[the]] maximum acceleration, with the further result ~~to be~~ being improved [[the]] firing speed of the gun. This is caused [[of]] by the ~~spring's (3)~~ inertia ~~status~~ of spring 3, which ~~spring (3)~~ acts as an extra powerful suspension against the slide [[(K)]], with direction opposite of the slide's [[(K)]] recoil direction, hence minimizing the intensity and the duration of the recoil. The time lag, which is caused [[of]] by the magnet's [[(M)]] presence, causes the gases' maximum expansion and gives bigger initial speed to the bullet, with the consequence of the bullet's firing range ~~increase~~ increasing. The spring [[(3)]] 3 has also positive effect [[to]] on the slide's [[(K)]] axial [[drifts]] motion, since the slide's [[(K)]] time of roll back to the initial position is faster.

Beyond the magnet's [[(M) pre-]]mentioned support method[,] by the axle's [[(4)]] extension [[(P)]], another ~~magnet's~~ magnet support method is by the use of a base, like the base 9 of Fig. 2 ~~(9) of figure -2-~~. In this case the base [[(9)]] 9 is locked on the frame of the gun so as to be immovable and on which base [[(9)]] the magnet [[(M)]] M is positioned and attracts the cylinder [[(1)]] 1 and the slide [[(K)]] K. In this case, the extension [[(P) of the axle [[(4)]] doesn't need to be extended to the magnet [[(M)]], as this is depicted in Fig. 2 ~~figure -2-~~.

The system may function also without a magnet, by using only the mechanical parts, but in this case the bullet will not have longer firing range.

~~Sine the invention being expanded beyond its limits, but by~~ By the proper forming of the invention's main parts, like the cylinder's and axle's shape, the springs' resistance force and dimensions, while the spring [[(3)]] 3 maintains the specifications of its freedom ~~degree~~, the system ~~will be possible to~~ can fit [[to]] any gun type.

ABSTRACT OF THE DISCLOSURE

~~MAGNETOMECHANICAL SYSTEM FOR REDUCTION OF THE RECOIL OF A GUN.~~

A ~~Magnetomechanical or mechanical system for the recoil's~~ recoil reduction mechanism for a gun includes ~~in a gun upon firing. This system consists of~~ two successive springs ~~cooperated~~ cooperating with a cylinder, an [[axel]] axle and a magnet. The magnet attracts the gun's slide and the cylinder, in a direction opposite of the slide's and the cylinder's recoil direction. A third spring, because of its position and size, acts as an extra suspension for the gun's recoil ~~recoil's reduction~~, and as an accelerator for the slide's reciprocating motion.